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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/789,115	MICHEL FENOUIL ET AL.	
	Examiner	Art Unit	
	Frank C. Campanell	1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46,152,155 and 156* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-23,25-40,42-46,152,155-156* is/are rejected.

7)☒ Claim(s) *4,5,11-14,18,24,41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/18/2005 and 07//15/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The Title is retained from the parent patent application. Nowhere in 10789115 is an arylsulfonate mentioned in the claims.

Claim Objections

2. Claims 11-14 are objected to because of the following informalities: Claims 11-14 refer to "branches" of claim one without disclosing if the branches are of the isoparaffin or branches of the olefin product.. Appropriate correction is required.

Double Patenting

3. Applicant is advised that should claim 2 be found allowable, claim 18 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 6, 17-19, 25-28, 30-32, 35, 36-40, 42-46, 152, and 155-156 are rejected under 35 U.S.C. 102(e) as being anticipated by Marinangeli et al. (US 6187981 B1)

Regarding claim 1, the Marinangeli et al. reference teaches a process for preparing a product comprising branched olefins, said process comprising: hydrocracking and hydroisomerizing a paraffinic wax to produce an isoparaffinic composition comprising 0.5% or less quaternary carbon atoms, said isoparaffinic composition comprising paraffins having a carbon number of from about 7 to about 18, at least a portion of said paraffins (see Marinangeli column 9 lines 1-17 and column 10 line 15- column 11 line 65. There is no specific reference to hydrocracking, but the conditions set forth in the process would produce some hydrocracking. The isomerizing is explicitly stated as being done in the presence

of hydrogen, and is hence hydroisomerizing.) being branched paraffins comprising an average number of branches per paraffin molecule of at least 0.5, (see Marinangeli column 9 lines 1-17) said branches comprising a first number of methyl branches and optionally a second number of ethyl branches; (see Marinangeli column 9 lines 1-17) exposing said isoparaffinic composition to a dehydrogenation catalyst in an amount and under dehydrogenation conditions effective to dehydrogenate said branched paraffins and to produce said branched olefins comprising 0.5% or less quaternary aliphatic carbon atoms (see Marinangeli column 11 lines 5-11 and Marinangeli column 17 lines 52-67)

Regarding claim 2, the Marinangeli et al. reference teaches said isoparaffinic composition and said branched olefins comprise 0.3% or less quaternary aliphatic carbon atoms. (see Marinangeli column 11 lines 5-11)

Regarding claim 3, the Marinangeli et al. reference teaches The process of claim 1 wherein said isoparaffinic composition comprises at least about 50% w of said branched paraffins. (see Marinangeli column 10 lines 50-60)

Regarding claim 6, the Marinangeli et al. reference teaches the process of claim 1 wherein said paraffins have a carbon number in the range of from 7 to 35. (see Marinangeli column 10 lines 36-40)

Regarding claim 17, the Marinangeli et al. reference teaches a process for preparing a product comprising branched olefins, said process comprising: hydrocracking and hydroisomerizing a paraffinic wax to produce an isoparaffinic composition comprising 0.5% or less quaternary aliphatic carbon atoms, said isoparaffinic composition comprising paraffins having a carbon number of from about 7 to about 18, at least a portion of said paraffins (see Marinangeli column 9 lines 1-17 and column 10 line 15- column 11 line 65. There is no specific reference to hydrocracking, but the conditions set forth in the process would produce at least some hydrocracking) being branched paraffins comprising an average number of branches per paraffin molecule of at least 0.5, (see Marinangeli column 9 lines 1-17) said branches comprising a first number of methyl branches and optionally a second number of ethyl branches; (see Marinangeli column 9 lines 1-17) exposing said isoparaffinic composition to a dehydrogenation catalyst in an amount and under dehydrogenation conditions effective to dehydrogenate said branched paraffins and to produce said branched olefins comprising 0.5% or less quaternary aliphatic carbon atoms (see Marinangeli column 11 lines 5-11 and Marinangeli column 17 lines 52-67)

Regarding claim 18, see the rejection of claim 2, as they are the exact same claim word for word.

Regarding claim 19, the Marinangeli et al. reference teaches The process of claim 1 wherein said isoparaffinic composition comprises at least about 50% w of said branched paraffins. (see Marinangeli column 10 lines 50-60)

Regarding claim 25, the Marinangeli et al. reference teaches the process of claim 1 wherein said dehydrogenation catalyst comprises a quantity of metal or metal compound selected from the group consisting of chrome oxide, iron oxide and, noble metals. (see Marinangeli column 14 lines 20-31, noble metal is listed in the prior art as platinum and palladium)

Regarding claim 26, the Marinangeli et al. reference teaches the process of claim 1 wherein said dehydrogenation catalyst comprises a quantity of noble metal selected from the group consisting of platinum, palladium, iridium, ruthenium, osmium and rhodium. (see Marinangeli column 14 lines 20-31)

Regarding claim 27, the Marinangeli et al. reference teaches the process of claim 1 wherein said dehydrogenation catalyst comprises a quantity of noble metal selected from the group consisting of palladium and platinum. (see Marinangeli column 14 lines 20-31)

Regarding claim 28, the Marinangeli et al. reference teaches the process of claim 1 wherein said dehydrogenation catalyst comprises a quantity of platinum. (see Marinangeli column 14 lines 20-31)

Regarding claim 30, the Marinangeli et al. reference teaches the process of claim 25 wherein said dehydrogenation catalyst further comprises a porous support selected from the group consisting of gamma alumina or eta alumina. (see Marinangeli column 12 lines 48-52)

Regarding claim 31, the Marinangeli et al. reference teaches the process of claim 25 where said quantity of metal or metal compound is from about 0.01 to 5% w based on the weight of the catalyst. (see Marinangeli column 16 lines 49-65, the metal is platinum)

Regarding claim 32, the Marinangeli et al. reference teaches the process of claim 26 wherein said catalyst further comprises from about 0.01 to about.5% w of one or more metals selected from the group consisting of Group 3a, Group 4a and Group 5a of the Periodic Table of Elements. (see Marinangeli column 16 lines 49-65 and column 14 lines 52-56. Tin is listed as a promoter metal)

Regarding claim 35, the Marinangeli et al. reference teaches the process of claim 26 wherein said catalyst further comprises from about 0.01 to about 5% w of one or more halogens. (see Marinangeli column 16 lines 28-34)

Regarding claim 36, the Marinangeli et al. reference teaches the process of claim 26 wherein said catalyst further comprises from about 0.01 to about 5% w independently of tin (see Marinangeli column 14 lines 53-55 where tin is a

promoter metal and column 16 lines 50-55 for %w.) and chlorine (see Marinangeli column 14 lines 28-34.)

Regarding claim 37, the Marinangeli et al. reference teaches the process of claim 1 wherein said catalyst is selected from the group consisting of chrome oxide on gamma alumina, platinum on gamma alumina, palladium on gamma alumina, platinum/lithium on gamma alumina, platinum/potassium on gamma alumina, platinum/tin on gamma alumina, platinum/tin on hydrotalcite, platinum/indium on gamma alumina and platinum/bismuth on gamma alumina. (see Marinangeli column 12 lines 48-52, this gives the gamma alumina structure. See Marinangeli column 14 lines 20-31. This gives platinum to be layered on the structure.)

Regarding claim 38, the Marinangeli et al. reference teaches the process of claim 1 wherein said dehydrogenation conditions comprise a temperature of from about 300.degree. C. to about 700.degree. C. and a pressure of from about 1.1 to 15 bar absolute. (see Marinangeli column 17 lines 6-10)

Regarding claim 39, the Marinangeli et al. reference teaches the process of claim 1 wherein hydrogen is fed to said dehydrogenation catalyst with said isoparaffinic composition. (see Marinangeli column 17 lines 21-30)

Regarding claim 40, the Marinangeli et al. reference teaches the process of claim 39 wherein said hydrogen and said paraffins are fed at a molar ratio of from about 0.1 to about 20. (see Marinangeli column 17 lines 21-30)

Regarding claim 42, the Marinangeli et al. reference teaches the process of claim 1 wherein said branched olefins comprise non-converted paraffins and said process further comprises separating said non-converted paraffins from said branched olefin product and recycling said non-converted paraffins to said dehydrogenation catalyst. (see Marinangeli column 25 lines 22-25)

Regarding claim 43, the Marinangeli et al. reference teaches the process of claim 42 wherein said separating comprises exposing said product comprising non-converted paraffins to molecular sieves. (see Marinangeli column 26 lines 55-60)

Regarding claim 44, the Marinangeli et al. reference teaches the process of claim 43 wherein said molecular sieves are zeolites. (see Marinangeli column 26 lines 55-60)

Regarding claim 45, the Marinangeli et al. reference teaches the process of claim 1 wherein said branched olefin product comprises from about 1 to about 50% mole olefins relative to the total number of moles of olefins and paraffins present. (see Marinangeli column 25 lines 50-60)

Regarding claim 46, the Marinangeli et al. reference teaches the process of claim 1 wherein said branched olefin product comprises from about 10 to about 20% mole olefins relative to the total number of moles of olefins and paraffins present in said product. (see Marinangeli et al. column 25 lines 50-60)

Regarding claim 152, the Marinangeli et al. reference teaches a branched olefin composition made by the process of claim 1 (see Marinangeli et al. column 11 lines 5-11 and Marinangeli et al. column 17 lines 52-67).

Regarding claim 155, the Marinangeli et al. reference teaches a process for preparing a product comprising branched olefins, said process comprising: hydroisomerizing a paraffinic wax to produce an isoparaffinic composition comprising 0.5% or less quaternary carbon atoms, said isoparaffinic composition comprising paraffins having a carbon number of from about 7 to about 18, at least a portion of said paraffins (see Marinangeli et al. column 9 lines 1-17, and column 10 line 15- column 11 line 65.) being branched paraffins comprising an average number of branches per paraffin molecule of at least 0.5, (see Marinangeli et al. column 9 lines 1-17) said branches comprising a first number of methyl branches and optionally a second number of ethyl branches; (see Marinangeli et al. column 9 lines 1-17) exposing said isoparaffinic composition to a dehydrogenation catalyst in an amount and under dehydrogenation conditions effective to dehydrogenate

said branched paraffins and to produce said branched olefins comprising 0.5% or less quaternary aliphatic carbon atoms (see Marinangeli et al. column 11 lines 5-11 and Marinangeli column 17 lines 52-67)

Regarding claim 156, the Marinangeli et al. reference teaches a process for preparing a product comprising branched olefins, said process comprising: hydroisomerizing a paraffinic wax to produce an isoparaffinic composition comprising 0.5% or less quaternary aliphatic carbon atoms, said isoparaffinic composition comprising paraffins having a carbon number of from about 7 to about 18, at least a portion of said paraffins (see Marinangeli et al. column 9 lines 1-17, and column 10 line 15- column 11 line 65.) being branched paraffins comprising an average number of branches per paraffin molecule of at least 0.5, (see Marinangeli et al. column 9 lines 1-17) said branches comprising a first number of methyl branches and optionally a second number of ethyl branches; (see Marinangeli et al. column 9 lines 1-17) exposing said isoparaffinic composition to a dehydrogenation catalyst in an amount and under dehydrogenation conditions effective to dehydrogenate said branched paraffins and to produce said branched olefins comprising 0.5% or less quaternary aliphatic carbon atoms (see Marinangeli et al. column 11 lines 5-11 and Marinangeli et al. column 17 lines 52-67)

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 7-16, 20-23, 33-34, and 45-46 rejected under 35 U.S.C. 103(a) as being unpatentable over Marinangeli et al. (US 6187981 B1).

Regarding claim 7, the Marinangeli et al. reference teaches (column 10 lines 36-40) the process of the isomerized product stream comprises paraffins having a total number of carbon atoms per paraffin molecule of generally from about 8 to about 28, preferably from 8 to 15, and more preferably from 10 to 15 carbon atoms. The isomerized product stream generally contains a higher concentration of lightly branched paraffins. Marinangeli et al. does not teach a specific percent of

said isoparaffinic composition having a carbon number in the given range of claim 7. It would have been obvious to one of ordinary skill in the art at the time of the invention that 1. the carbon range number is well within the preferred embodiment of the prior art and 2. one of ordinary skill in the art would attempt to make the maximum percentage of isomerized paraffins in the preferred range for the preferred embodiment of the prior art.

Regarding claim 8, the Marinangeli et al. reference teaches (column 10 lines 36-40) the process of the isomerized product stream comprises paraffins having a total number of carbon atoms per paraffin molecule of generally from about 8 to about 28, preferably from 8 to 15, and more preferably from 10 to 15 carbon atoms. The isomerized product stream generally contains a higher concentration of lightly branched paraffins. Marinangeli et al. does not teach a specific percent of said isoparaffinic composition having a carbon number in the given range of claim 8. It would have been obvious to one of ordinary skill in the art at the time of the invention that 1. the carbon range number is well within the preferred embodiment of the prior art and 2. one of ordinary skill in the art would attempt to make the maximum percentage of isomerized paraffins in the preferred range for the preferred embodiment of the prior art.

Regarding claim 9, the Marinangeli et al. reference teaches (column 10 lines 36-40) the process of the isomerized product stream comprises paraffins having a total number of carbon atoms per paraffin molecule of generally from about 8 to about 28, preferably from 8 to 15, and more preferably from 10 to 15 carbon atoms. The isomerized product stream generally contains a higher concentration of lightly branched paraffins. Marinangeli et al. does not teach a specific percent of said isoparaffinic composition having a carbon number in the given range of claim 9. It would have been obvious to one of ordinary skill in the art at the time of the invention that 1. the carbon range number is well within the preferred embodiment of the prior art and 2. one of ordinary skill in the art would attempt to make the maximum percentage of isomerized paraffins in the preferred range for the preferred embodiment of the prior art.

Regarding claim 10, the Marinangeli et al. reference teaches (column 10 lines 36-40) the process of the isomerized product stream comprises paraffins having a total number of carbon atoms per paraffin molecule of generally from about 8 to about 28, preferably from 8 to 15, and more preferably from 10 to 15 carbon atoms. The isomerized product stream generally contains a higher concentration of lightly branched paraffins. Marinangeli et al. does not teach a specific percent of said isoparaffinic composition having a carbon number in the

given range of claim 10. It would have been obvious to one of ordinary skill in the art at the time of the invention that 1. the carbon range number is well within the preferred embodiment of the prior art and 2. one of ordinary skill in the art would attempt to make the maximum percentage of isomerized paraffins in the preferred range for the preferred embodiment of the prior art.

Regarding claims 11-14, the assumption is made that the word "branched" refers to the isoparaffins, and not the branched olefins. The claim as written is unclear. Please refer to the objection above.

Regarding claim 11, the Marinangeli et al. reference teaches (column 9 lines 10-17) that the skeletal isomerization of the paraffin molecule preferably comprises increasing by 2, or more preferably by 1, the number of methyl group branches of the aliphatic alkyl chain. Because the total number of carbon atoms of the paraffin molecule remains the same, each additional methyl group branch causes a corresponding reduction by one of the number of carbon atoms in the aliphatic alkyl chain. Clearly this prior art teaches the most desirable isomerization is one which involves the addition of a single branch. Marinangeli et al. does not teach any specific average number of branches. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to make the

average number of branches as close to the value 1 as possible because this is specifically stated as the preferred embodiment of the art. (column 9 lines 10-17)

Regarding claim 12, the Marinangeli et al. reference teaches (column 9 lines 10-17) that the skeletal isomerization of the paraffin molecule preferably comprises increasing by 2, or more preferably by 1, the number of methyl group branches of the aliphatic alkyl chain. Because the total number of carbon atoms of the paraffin molecule remains the same, each additional methyl group branch causes a corresponding reduction by one of the number of carbon atoms in the aliphatic alkyl chain. Clearly this prior art teaches the most desirable isomerization is one which involves the addition of a single branch. Marinangeli et al. does not teach any specific average number of branches. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to make the average number of branches as close to the value 1 as possible because this is specifically stated as the preferred embodiment of the art. (column 9 lines 10-17).

Regarding claim 13, the Marinangeli et al. reference teaches (column 9 lines 10-17) that the skeletal isomerization of the paraffin molecule preferably comprises increasing by 2, or more preferably by 1, the number of methyl group branches of the aliphatic alkyl chain. Because the total number of carbon atoms of the paraffin molecule remains the same, each additional methyl group branch

causes a corresponding reduction by one of the number of carbon atoms in the aliphatic alkyl chain. Clearly this prior art teaches the most desirable isomerization is one which involves the addition of a single branch. Marinangeli et al. does not teach any specific average number of branches. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to make the average number of branches as close to the value 1 as possible because this is specifically stated as the preferred embodiment of the art. (column 9 lines 10-17).

Regarding claim 14, the Marinangeli et al. reference teaches (column 9 lines 10-17) that the skeletal isomerization of the paraffin molecule preferably comprises increasing by 2, or more preferably by 1, the number of methyl group branches of the aliphatic alkyl chain. Because the total number of carbon atoms of the paraffin molecule remains the same, each additional methyl group branch causes a corresponding reduction by one of the number of carbon atoms in the aliphatic alkyl chain. Clearly this prior art teaches the most desirable isomerization is one which involves the addition of a single branch. Marinangeli et al. does not teach any specific average number of branches. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to make the average number of branches as close to the value 1 as possible because this is specifically stated as the preferred embodiment of the art. (column 9 lines 10-17).

Regarding claim 15, the Marinangeli et al. reference teaches (column 7 lines 39-44) the alkyl group branch or branches of the lightly branched paraffin are generally selected from methyl, ethyl, and propyl groups, with shorter and normal branches being preferred. Marinangeli et al. does not teach the percentage of branches that are methyl. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to maximize the number of methyl branches, as that is the preferred embodiment of the prior art.

Regarding claim 16, the Marinangeli et al. reference teaches (column 7 lines 39-44) the alkyl group branch or branches of the lightly branched paraffin are generally selected from methyl, ethyl, and propyl groups, with shorter and normal branches being preferred. Marinangeli et al. does not teach the percentage of branches that are methyl. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to minimize the number of ethyl branches, as that is the preferred embodiment of the prior art.

Regarding claim 20, the Marinangeli et al. reference teaches (column 10, lines 51-56) The lightly branched paraffins having 3 or 4 primary carbon atoms and no quaternary carbon atoms comprise preferably more than 25 mol-%, and more preferably more than 60 mol-%, of the isomerized product stream or in that portion of the isomerized product stream that passes to the dehydrogenation zone.

Marinangeli et al. does not teach any specific percentage of linear paraffins in the isomerized product. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to minimize the amount of linear paraffins, as that is the preferred embodiment of the prior art.

Regarding claim 21, the Marinangeli et al. reference teaches (column 10, lines 51-56) The lightly branched paraffins having 3 or 4 primary carbon atoms and no quaternary carbon atoms comprise preferably more than 25 mol-%, and more preferably more than 60 mol-%, of the isomerized product stream or in that portion of the isomerized product stream that passes to the dehydrogenation zone. Marinangeli et al. does not teach any specific percentage of linear paraffins in the isomerized product. It would have been obvious to one of ordinary skill in the art at the time of the invention to attempt to minimize the amount of linear paraffins, as that is the preferred embodiment of the prior art.

Regarding claim 33, the Marinangeli et al. reference teaches (column 14, lines 55-60) the use of alkaline earth metals, in particular lithium and potassium, as metals to be used to modify other metals. Marinangeli also teaches that the two other groups of metals to be modified are the platinum group and the promoter group, and that these groups are preferably to compose .01-5%w of the catalyst. (column 16 lines 49-60) Marinangeli et al. does not teach any specific percentage

of the catalyst that is to be that alkaline earth metal. It would have been obvious to one of ordinary skill in the art at the time of the invention to keep the weight percentage of the modifier metal to a smaller percentage weight than the metal group which it modifies. It is inherent that a modifier metal should be present in an amount less then the metal it is to modify. Hence the percentage of alkali earth metal would fall in the .01-5%w range.

Regarding claim 34, the Marinangeli et al. reference teaches (column 14, lines 55-60) the use of alkaline earth metals, in particular lithium and potassium, as metals to be used to modify other metals. Marinangeli also teaches that the two other groups of metals to be modified are the platinum group and the promoter group (tin is listed in this group), and that these groups are preferably to compose .01-5%w of the catalyst. (column 16 lines 49-60) Marinangeli et al. does not teach any specific percentage of the catalyst that is to be that alkaline earth metal. It would have been obvious to one of ordinary skill in the art at the time of the invention to keep the weight percentage of the modifier metal to a smaller percentage weight than the metal group which it modifies. It is inherent that a modifier metal should be present in an amount less then the metal it is to modify. Hence the percentage of alkali earth metal would fall in the .01-5%w range.

Regarding claim 45, the Marinangeli et al. reference teaches (column 17, lines 47-52) that typically 25% to 75% of the olefins in the olefin stream are unbranched olefins. The isomerization process does not convert all the paraffins to branched paraffins. It would have been obvious to one of ordinary skill in the art at the time of the invention that the total number of moles of branched olefin product relative to the total moles of olefins and paraffins present would reasonable fall into the range of 1 to 50%.

Regarding claim 46, the Marinangeli et al. reference teaches (column 17, lines 47-52) that typically 25% to 75% of the olefins in the olefin stream are unbranched olefins. The isomerization process does not convert all the paraffins to branched paraffins. It would have been obvious to one of ordinary skill in the art at the time of the invention that the total number of moles of branched olefin product relative to the total moles of olefins and paraffins present would reasonable fall into the range of 10 to 20%.

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marinangeli et al. (US 6187981), in further in view of Wittenbrink et al. (US 5866748)

Regarding claim 22, the Marinangeli et al. reference teaches the process of claim one. Marinangeli et al. does not teach any specific way to make the n-

paraffin feedstock used to make the isoparaffins. Wittenbrink, which is analogous art teaching the hydroisomerization of a n-paraffin feedstock, teaches the use of the Fischer-Tropsch process to produce a high quality n-paraffin feedstock. (column 2, lines 55-65) Wittenbrink does not teach the process of claim one. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the Fischer Tropsch process to produce the paraffin feedstock material as described in Wittenbrink to make the feedstock used in Marinangeli. The reason for this is explicitly stated in Wittenbrink as "Fischer-Tropsch process; a process known to produce substantially n-paraffins having negligible amounts of aromatics, sulfur and nitrogen compounds." The Fischer Tropsch process is well know in the art to be a effective way to produce n-paraffins, which are then changed into said isoparaffins in claim 22.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marinangeli et al. (US 6187981), in further in view of Lutz (US 5250718)

the Marinangeli et al. reference teaches the process of claim one. Marinangeli et al. does not teach any specific way to make the olefins. Lutz, which is analogous art teaching a process to produce alkyl sulfate-containing surfactant compositions, teaches the use of the ethylene oligomerization process to produce a high quality olefins. (column 2, lines 57-70) Lutz does not teach the

process of claim one. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the ethylene oligomerization process to produce the olefins as described in Lutz to make the olefins used in Marinangeli. The reason for this is explicitly stated in Lutz as "The resulting oligomerization products are substantially of linear structure and thus products are substantially of linear structure."

7. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marinangeli et al. (US 6187981), in further in view of Imai et al (US 4430517)

Regarding claim 29, the Marinangeli et al. reference teaches the process of claim 25 with a dehydrogenation catalyst. Marinangeli does not teach the dehydrogenation catalyst having a porous support selected from the group consisting of activated carbon; coke; charcoal; silica; silica gel; synthetic clays; and silicates. (see Marinangeli column 24 lines 7-12) Imai et al., which is analogous art teaching the dehydrogenation process using a catalyst, teaches a dehydrogenation catalyst having a porous support selected from the group consisting of activated carbon; coke; charcoal; silica; silica gel; synthetic clays; and silicates. (column 7, lines 13-25) Imai does not teach the process of claim 25. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the porous support described in Imai as part of the

dehydrogenation catalyst taught in Marinangeli. The reasons for this are explicitly stated in Imai as "The porous carrier material should be relatively refractory to the conditions utilized in the hydrocarbon conversion process. It is intended to include within the scope of our invention the use of carrier materials which have traditionally been utilized in hydrocarbon conversion catalyst."

Allowable Subject Matter

8. Claims 4, 5, 24, 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 4 and 5, the given percentages of branched paraffins in the given carbon atom number limitations are not taught in prior art.

Regarding claim 24, the process of claim 1 wherein the isoparaffinic composition is treated with an absorbent under conditions effective to perform a function selected from the group consisting of reducing linear paraffin content to favorably adjusting the number of branches of the reduced linear paraffin is not taught in the prior art.

Regarding claim 41, the process of claim 1 wherein said dehydrogenation conditions comprise a residence time is taught in the prior art. The prior art does not teach any specific conversion percentage, but the prior art does teach a preference for either high or low isoparaffinic conversion.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4523045 A

US 6175048 B1

US 20020004624 A1

US 5093540 A

US 5250718 A

WO 9905082 A1

US 3681424 A

US 5639926 A

WO 9701521 A1.

US 5866748

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank C. Campanell whose telephone number is 571-270-3165. The examiner can normally be reached on Mon-Fri 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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FCC

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